



MANITOBA EXPLORATION HIGHLIGHTS

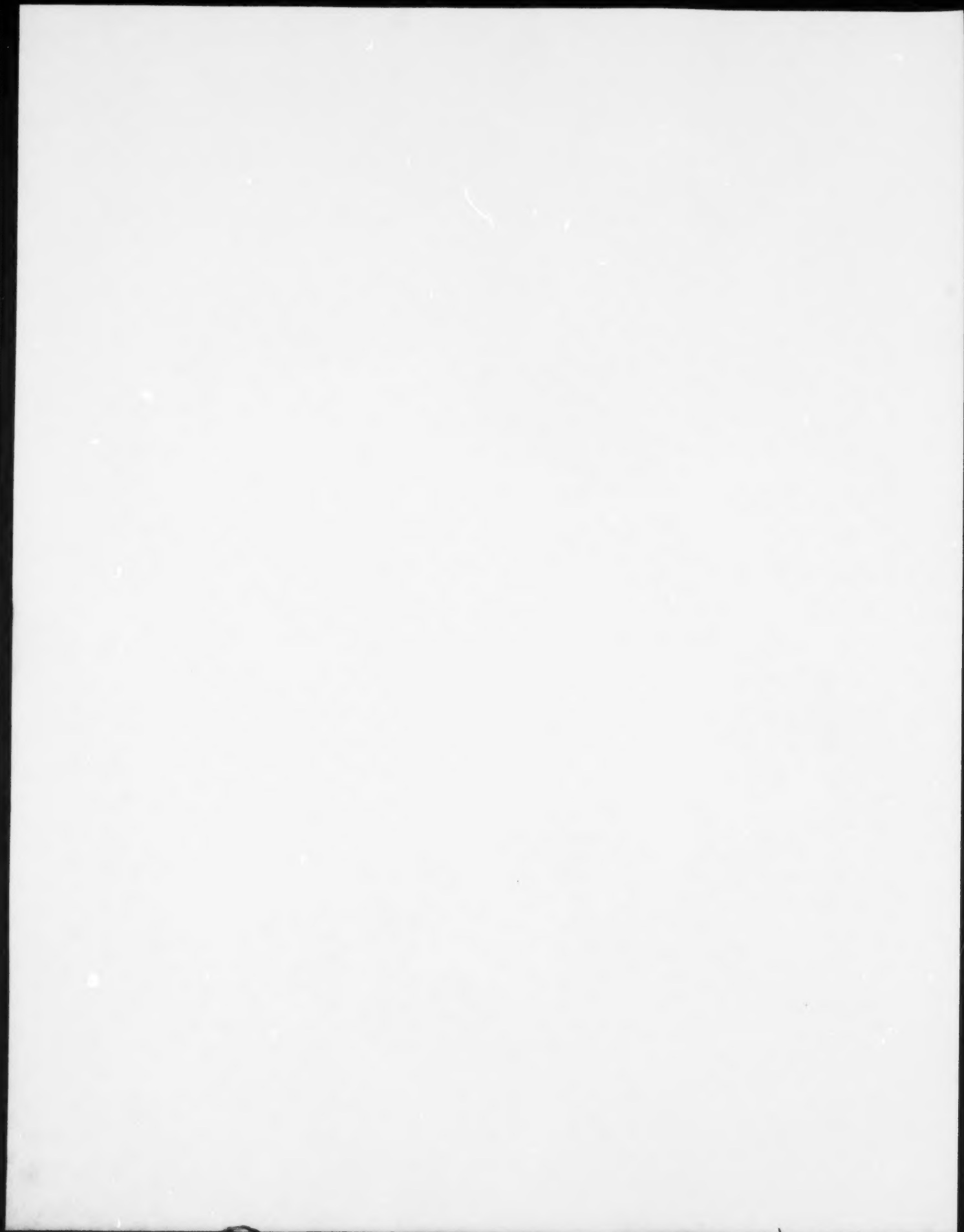
MARCH 1988 - FEBRUARY 1989

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Compiled by:

Exploration Services Section
Manitoba Energy and Mines

March 1989



I. GOLD EXPLORATION

LynnGold Resources Inc.

- MacLellan Mine**
- 1989 gold output expected to reach 2177 kg (70 000 oz) (Northern Miner, June 27, 1988). Production costs increased slightly to \$325 (US) per oz. (Winnipeg Free Press, December 1, 1988)
 - as of June 30, 1988, mineable reserves in Main zone are 998 000 tonnes (1 100 000 tons) averaging 6.51 g/tonne (0.19 oz/ton) gold and about 18.89 g/tonne (0.551 oz/ton) silver. The East Main hosts 176 000 tonnes (194 000 tons) of the same grade. (Northern Miner, May 30, 1988).
 - surface anomaly drilling 366 m (1200 feet) south of the mine, in the South Zone found economic gold values in a broad alteration zone (Thompson Nickel Belt News, May 24, 1988).
- Nisku**
- immediately east of MacLellan Mine, production of 200 tonnes (220 tons) per day from July 1988.
 - drill indicated reserves 187 000 tonnes (206 000 tons) averaging 6.51 g/tonne (0.19 oz/ton) gold. (Northern Miner, May 30, 1988)
- Rainbow**
- immediately west of MacLellan Mine.
 - drill indicated geological reserves 539 577 tonnes (594 903 tons) averaging 8.74 g/tonne (0.255 oz/ton) gold (Northern Breeze, January 25, 1989).
- Dot Lake**
- 1.6 km (1 mile) west of MacLellan Mine.
 - geological reserves 1 248 000 tonnes (1 376 000 tons) averaging 4.01 g/tonne (0.117 oz/ton) gold in 7 zones (Northern Miner, January 19, 1987).
 - LynnGold acquired Novamin Resources Inc.'s 45% interest in the property (Thompson Nickel Belt News, May 24, 1988).
 - in the second quarter of 1988 a total of 4000 m (13 700 feet) of a proposed 5600 m (18 500-foot) drill program was completed (Winnipeg Free Press, August 19, 1988).

LynnGold Resources Inc./Trans America Industries Ltd.

- Burnt Timber**
- at Wasekwan Lake 11 km (7 miles) southeast of MacLellan Mine
 - gold reserves amenable to open pit mining outlined at 1.0 million tonnes (1.1 million tons) grading 3.81 g/tonne (0.111 oz/ton). The zone is at least 6 m wide (20 feet) and 121 m deep (400 feet) and is found in a lower grade envelope which totals 1.9 million tonnes (2.1 million tons) grading 1.17 g/tonne (0.034 oz/ton) gold.
 - a prefeasibility study, including rock mechanics, metallurgical and overburden testing, has begun.

- another gold discovery has been made 60 m (200 feet) north of the Burnt Timber deposit, including one intersection of 34.70 g/tonne (1.012 oz/ton) gold over 1.6 m (5.3 feet) (Northern Miner, October 31, 1988).

Manitoba Mineral Resources Ltd./Mingold Resources

Farley Lake

- the Wendy zone and East zone have combined geological reserves of 1.30 million tonnes (1.43 million tons) averaging 7.03 g/tonne (0.205 oz/ton) that may be amenable to open pit mining (Northern Miner, January 16, 1989).
- the South zone is deeper and present estimates are 363 000 tonnes (400 000 tons) of 4.80 g/tonne (0.14 oz/ton) gold (Manitoba Mineral Resources Ltd. and Farley Gold Inc., release to the Northern Miner, January 1987).
- a feasibility study has been completed and a production decision will be made in 1989 if the results are positive. A 10 900 tonne (12 000-ton) bulk sample was taken and final feasibility study is underway (Northern Miner, January 16, 1989).
- total open pit mining reserves in two zones outlined at 2.23 million tonnes (2.46 million tons) grading 3.56 g/tonne (0.104 oz/ton) gold (Personal Communication, N. Briggs, Manitoba Mineral Resources, October, 1988).

Balcor Resources Corp.

Lasthope

- North shoot discovery - current drill-proven, probable and possible 541 000 tonnes (596 000 tons) grading 8.23 g/tonne (0.24 oz/ton) gold uncut over an average true width of 1.5 m (5 feet) which includes 95 700 tonnes (105 500 tons) grading 19.89 g/tonne (0.58 oz/ton) gold to a depth of 366 m (1200 feet).
- vein structure tested to 640 m (2100 feet) (Northern Miner, June 20, 1988).
- drill-proven and probable reserves only are 522 000 tonnes (575 000 tons) grading 10.35 g/tonne (0.302 oz/ton) gold (Personal Communication, W. Johnstone, Balcor Resources, October, 1988).

Granges Exploration Ltd./Mid-North Resources Limited

Gurney Mine

- east of Flin Flon; operated from 1937 to 1939 and produced 777.6 kg (25 000 oz) gold and 2208.3 kg (71 000 oz) silver (Winnipeg Free Press, January 14, 1989).
- recent drilling program produced encouraging results.

Hole No.	<u>Length</u>		<u>Gold</u>		<u>Silver</u>	
	m	ft	g/tonne	oz/ton	g/tonne	oz/ton
2	1.7	5.74	3.70	0.108	8.13	0.237
7	12.5	40.94	4.05	0.118	42.86	1.25
16	0.5	1.64	8.88	0.259	377.14	11.00
19	1.2	3.93	6.86	0.200	86.06	2.51
21	0.4	1.20	5.31	0.155	160.11	4.67

(Mid-North, News Release, February 20, 1989).

Golden Range Resources Ltd./Mingold Resources

Vamp Lake (Hudvam)

- reserves in Zone No.3 are 257 768 tonnes (284 198 tons) grading 2.30 g/tonne (0.067 oz/ton) gold, 13.71 g/tonne (0.40 oz/ton) silver, 1.15% copper, 2.3% zinc.
- reserves in Zone No.1C are 217 289 tonnes (239 569 tons) grading 4.29 g/tonne (0.20 oz/ton) gold (cut), 19.20 g/tonne (0.56 oz/ton) silver, 2.14% copper, 2.7% zinc (Northern Miner, January 25, 1988).
- combined drill proven, probable and possible reserve inventory 739 000 tonnes (815 000 tons) grading 3.40 g/tonne (0.116 oz/ton) gold, 13.03 g/tonne (0.38 oz/ton) silver, 1.34% copper and 1.9% zinc (Northern Miner, February 13, 1989).
- after spending \$2 million, only 213 m (700 feet) of a 1500 m (5000 foot) decline to the ore zones has been completed. Additional funds to finish the job were not raised by Golden Range, which was taken over by Mingold in a reverse acquisition agreement (Northern Miner, October 3, 1988).

High River Gold Mines

Nor-Acme Mine

- proven and drill indicated geological, probable and possible reserves of 4 526 000 tonnes (4 990 000 tons) at an undiluted grade of 4.97 g/tonne (0.145 oz/ton) gold including 1 850 000 tonnes (2 040 000 tons) of the same grade above the 542 m (1780-foot) level (Northern Miner, October 10, 1988).
- underground exploration, budgeted at \$2.25 million is designed to test the down-plunge extension of known deposits below the 542 m (1780-foot) level. Program consists of driving two crosscuts totalling 365 m (1200 feet) at the 542 m level and 6000 m (20 000 feet) of diamond drilling. A second phase will include additional crosscutting, drifting and rehabilitation of the 542 m level.
- Inco Gold can earn 50% in the property by providing the capital to place it into production, (sometime in 1989) subject to a positive feasibility report. Also Inco Gold could purchase up to 6.5 million shares of High River for a 40.1% interest in the company. It has already acquired 1.25 million shares (Northern Miner, December 19, 1988).

Boundary Zone

- near Nor-Acme Mine.
- three gold mineralized horizons outlined and drill intersections across 14.5 m (47.7 feet) returned 4.66 g/tonne (0.136 oz/ton) gold (Northern Miner, May 18, 1987).

**Tailings
Deposit**

- Sikaman Gold Resources has acquired right to treat an arsenopyrite tailing deposit from the previous operations at Nor-Acme. The company expects to produce 2939 kg (94 500 oz) gold during a 2-year period from reserves totalling 249 000 tonnes (274 000 tons) grading 13.03 g/tonne (0.38 oz/ton) at an operating cost of \$97 (US) per oz (Northern Miner, February 13, 1989).
- Sikaman anticipates production during fourth quarter of 1989. Project capital costs are estimated at \$14 million (US).
- High River Resources retains a 5% net smelter return royalty from all production. Total price of optioning property was \$5.88 million to be paid by issuing shares and promissory notes to Agassiz Resources, Segal Finance and Rex Resources Canada (Northern Miner, January 23, 1989).
- an arseno process plant, one of the first in Canada, using nitric acid to overcome environmental concerns will be tested by Sikaman (Northern Miner, January 9, 1989). Minproc Engineering carried out the feasibility study and concluded the project is technically and financially viable (Northern Miner, January 23, 1989).

Snow Lake Mines

**Snow Lake
Property**

- No.3 Zone reserves 508 000 tonnes (560 000 tons) at 9.57 g/tonne (0.279 oz/ton) gold and Birch Zone reserves 224 000 tonnes (247 000 tons) at 8.16 g/tonne (0.238 oz/ton) gold (Silver Hart Mines Ltd., Report to Shareholders, June 30, 1987).
- additional drilling between 122 m (400 feet) and 335 m (1100 feet) on No.3 indicates major deposit with larger reserves than above 122 m (400-foot) level (Northern Miner, June 22, 1987).
- projected mill capacity 540 tonnes (600 tons) per day commencing October 1988 and employing 350 persons (Nickel Belt News, November 16, 1987).
- 13 tonne (14 ton) bulk sample from surface (weathered) indicated gold recovery of 87.6% using conventional methods (Northern Miner, November 14, 1988).

Pierce Mountain Resources

**Ferro
Mine**

- east shore of Wekusko Lake, southeast of Snow Lake.
- proven and probable reserves, estimated by previous operators, 66 000 tonnes (73 000 tons) grading 13.37 g/tonne (0.39 oz/ton) gold plus a possible reserve of 10 000 tonnes (11 000 tons) at 11.66 g/tonne (0.34 oz/ton).
- previous development of 166 m (545 foot) shaft with 1311 m (4300 feet) of drifting on four levels.
- assays from current drill program are:

<u>Length</u>		<u>Gold</u>	
m	ft	g/tonne	oz/ton
2.6	8.5	36.00	1.050
1.6	5.1	9.30	0.271
1.4	4.5	10.22	0.298
1.8	6.0	31.03	0.905
3.5	11.5	15.57	0.454

- by end of February, Pierce Mountain will complete \$1 million in drilling and exploration programs and plans to spend \$1 million during 1989 season. Two drills scheduled for 86 holes totalling 9000 m (30 000 feet) including 46 holes to a maximum depth of 457 m (1500 feet) to increase indicated reserves, prior to dewatering and re-sampling underground workings. A third drill will be brought in to test other geophysical anomalies on the property (Northern Miner, January 30, 1989).

Westmin Resources Limited/Tanqueray Resources Limited/Estaurum Mines Ltd.

Little Stull

- in the West Zone, a large mineralized structure hosting two higher grade subzones with strike lengths of 150 m (500 feet) and 700 m (2300 feet) was outlined by drilling.

Hole No.	<u>Length</u>		<u>Gold</u>	
	m	ft	g/tonne	oz/ton
77	1.5	4.9	8.0	0.23
78	2.0	6.6	3.8	0.11
82	1.0	3.3	191.9	5.60
94	1.0	3.3	23.6	0.69

- another high grade subzone was identified 366 m (1200 feet) southeast of the West Zone. An assay of 76.46 g/tonne (2.23 oz/ton) gold was reported from Hole No. 86. (Westmin, News Release, August 31, 1988).

Bighorn Development Corporation/Wydmarr Development Corporation

**High Rock
Island
(Island Lake)
Property**

- drill indicated reserves from the Main Vein 5177 kg (166 439 oz) gold based on a strike length of 518 m (1700 feet), 253 m (830 feet) of down-dip extent, an average width of 1.9 m (6.1 feet) and a grade of 13.37 g/tonne (0.39 oz/ton) gold. This assumes 30% wastage and 15% dilution (Bighorn Development Corporation, Annual Report, 1987).
- revised drill indicated reserves are 426 000 tonnes (470 000 tons) averaging 10.28 g/tonne (0.30 oz/ton) gold (Personal Communication, J. Wyder, Wydmarr Developments, October, 1988).
- a 23 tonne (25 ton) per day test mill is on-site, a 90 tonne (100 ton) mill is under construction and a production decision was to be made February, 1988 (Thompson Nickel Belt, August 31, 1987).
- companies negotiating \$6 million private placement to put property into production at 180 tonnes per day (200 tons per day) (Wydmarr Development Corporation, News Release, June 20, 1988).

Bakra Resources Ltd./Cassiar Mining Corp.

Sannorm
Property

- northeast of San Antonio mine at Bissett, Bakra Resources may have a potential open pit situation in its A-Zone. Hole No. SN-88-13 returned a 18.6 m (61-foot) intersection averaging 6.17 g/tonne (0.18 oz/ton) gold and included 9.4 m (31 feet) grading 10.97 g/tonne (0.32 oz/ton) at a depth of about 122 m (400 feet). A low-grade envelope surrounds the core of the A-Zone; one of three outlined near surface.
- Bakra is earning a 50% interest in Sannorm from privately-owned affiliate Orenda Resources (both part of Homestead Group) and has spent about \$150 000 (Northern Miner, February 20, 1989).

San Antonio
Mine

- mineable reserves after allowing for dilution and mining recovery of 1.20 million tonnes (1.32 million tons) at an average grade of 7.65 g/tonne (0.223 oz/ton) between the 26th and 37th levels and is open at depth.
- capital costs to bring mine into production estimated at \$11.2 million and includes deepening A shaft by 274 m (900 feet) to the 16th level and deepening D shaft to access ore reserves below the 26th level.
- production is projected at 1244 kg (40 000 oz) per year with costs of \$230 (US) per oz for the first three years and a head grade of 8.6 g/tonne (0.25 oz/ton) gold. Production is then scheduled to decrease to 1014 kg (32 600 oz) per year at a head grade of 7.0 g/tonne (0.205 oz/ton) (Northern Miner, January 23, 1989).
- after review of a feasibility study done for Cassiar Mining Corp., Rea Gold Corp. intends to proceed with development. Review to include an audit of ore reserves, investigate mining methods, review milling process and waste management and estimate operating and capital requirements.
- to acquire San Antonio, Rea Gold will pay \$3.2 million to Cassiar Mining, issue 2 million shares at \$5 per share and a debt of \$1.8 million secured by a 5 year convertible debenture with 8% annual interest (Northern Miner, February 13, 1989).

II. BASE METAL EXPLORATION

Hudson Bay Mining and Smelting Co., Limited

- Ruttan West Anomaly** - exploration is being conducted on two ore bodies near the Ruttan Mine which could add three years life to the mine (Winnipeg Free Press, August 30, 1988).
- Chisel Lake Mine** - about \$19.8 million is being spent to develop an open pit for extracting the crown pillar estimated to contain 1.1 million tonnes (1.2 million tons) grading 10.5% zinc, 1.4% lead and 0.21% copper to a depth of 76 m (250 feet). Production schedules are expected to be 1040 tonnes per day (1150 tons per day). (Northern Miner Magazine, January, 1989).
- production from open pit slated for first quarter of 1989 (HBM&S, Report to Shareholders, November 17, 1988).
- discovery of new deeper high grade zone down plunge from mine outlined 2.4 million tonnes (2.7 million tons) of probable ore reserves (diluted to 15%) grading 9% zinc and 0.2% - 0.3% copper (Northern Miner, September 26, 1988).

Westfield Minerals Ltd./Goldbrae Developments Ltd.

- Big Island Lake** - a small geological deposit of about 180 000 tonnes (200 000 tons) with economic grades of copper, zinc, silver and gold outlined near Flin Flon. (Northern Miner, May 9, 1988)

Hudson Bay Mining and Smelting Co., Limited/Consolidated Callinan Flin Flon Mines Ltd.

- Callinan Property** - property located 900 m (3000 feet) north of Hudson Bay's North Main shaft at Flin Flon.
- production of 454 000 tonnes (500 000 tons) of ore annually to commence by end of 1989 with ore hoisted from South Main shaft 2.4 km (1.5 miles) from the deposit. Access has been gained from the 515 m (1690-foot) level of the Flin Flon mine and development will be from the 674 m (2210-foot) and 838 m (2750-foot) levels.
- proven reserves of 2.4 million tonnes (2.6 million tons) averaging 22.63 g/tonne (0.66 oz/ton) silver, 1.89 g/tonne (0.055 oz/ton) gold, 1.5% copper and 4% zinc.
- development of property will be as a joint venture with Manitoba Mineral Resources Ltd. investing \$9.7 million to earn 49% interest and Hudson Bay the balance of the \$18 million development cost to earn 51% interest. Consolidated Callinan retains a 6.67% net profits interest and will receive a 25¢ per ton royalty on all ore produced (Northern Miner, March 21, 1988).

Hudson Bay Mining and Smelting Co., Limited/Outokumpu Mines Limited

Namew Lake Mine

- proven reserves are estimated at 2.56 million tonnes (2.82 million tons) averaging 2.44% nickel and 0.9% copper.
- production of 476 000 tonnes (525 000 tons) of ore annually to yield 62 000 tonnes (68 000 tons) of nickel concentrate, with minor amounts of platinum and palladium and 12 200 tonnes (13 500 tons) of copper concentrates (Northern Miner, July 13, 1987).
- 410 m (1350 foot) shaft completed in early 1987, 1900 tonne (2100 ton) per day concentrator commissioned in November 1988; but running only at 400 tonnes (440 tons) per day during first quarter of 1989 (Northern Miner, January 9, 1989). Mine was officially opened, after a \$70 million expenditure, on November 15, 1988 (Winnipeg Free Press, November 16, 1988).
- Hudson Bay's annual share of 12.2 million pounds refined nickel will be produced at Sherritt Gordon's Alberta nickel refinery, and Outokumpu's share of 8.1 million pounds will be processed by Inco at Thompson. Both Hudson Bay's share of 4.4 million pounds of refined copper and Outokumpu's 2.9 million pounds will be processed in Flin Flon (Flin Flon Reminder, November 16, 1988).
- surface exploration is in progress.

Inco Limited

Birchtree Mine

- south of Thompson; operated from 1966 to 1977 and produced more than 112 million kg (300 million pounds) of nickel.
- reserves are 318 000 tonnes (350 000 tons) containing 261 million kg (700 million pounds) of nickel, sufficient to operate for 20 years; and the mine will employ 160 mining personnel in four years when it goes into full operation.
- existing shaft will be deepened from 1011 m (3370 feet) to 1317 m (4390 feet); and plans include development of underground ramps and excavation of drifts and ventilation facilities at a cost of \$58 million (Northern Miner, November 7, 1988 and Prospectors and Developers 1988 Exploration and Development Highlights).
- production to resume in 1989 and with advanced mining methods is expected to produce twice the daily output of the earlier operating period (Thompson Citizen, November 2, 1988).

Thompson Mine

- development of 1-C ore-body located northeast of T-3 mine shaft and from 732 m (2400 feet) down to 960 m (3150 feet) below surface at a cost of \$26.9 million. Estimated reserves are 4.5 million tonnes (5.0 million tons) and will be developed by: an access ramp to the bottom of the ore-body; a 3700 m (12 000-foot) long haulage drift at the 1097 m (3600-foot) level to transport ore and waste to the T-1

mine shaft; building ventilation raises and waste passes; and necessary modifications to the surface plant for power, heating and ventilation.

- the ramp is scheduled for completion by the third quarter of 1989, but some ore may be produced by end of 1988. The Vertical Block Mining method will be used when full production begins in 1990 at 1360 tonnes (1500 tons) per day for a 12 year period (Thompson Citizen, April 20, 1988).
- development of Thompson mine crown pillar between the surface and the 122 m (400-foot) level in Open Pit South at a cost of \$42 million. Estimated mineable reserves contain 68 million kg (150 million pounds) of nickel.
- the open pit is scheduled for production in 1990 when Open Pit North goes out of commission and will produce for five years (Northern Miner, November 7, 1988).
- dredging of 6 million cubic metres (8 million cubic yards) of overburden will begin by June 1989 and when completed, workers will be transferred from Open Pit North as it winds down (Thompson Citizen, November 2, 1988).

III. POTASH EXPLORATION

Manitoba Potash Corp./Canamax Resources Inc.

- Canamax-Russell - reserves 165 million tonnes (182 million tons) averaging 24.5% K₂O (Regina Leader-Post, October 3, 1988).
- Canamax, with 51% interest in the project, will develop the deposit, Manitoba Potash Corp., with 49%, will take care of marketing and finding investment capital. Over \$13 million has been spent on feasibility and marketing studies (Winnipeg Free Press, February 14, 1989).
 - Manitoba's mining costs could be \$5 to \$20 per tonne lower than Saskatoon-area mines because of favourable mining and milling characteristics of the deposit, low energy costs and the large scale of operation.
 - in 1987 dollars, capital cost is estimated at about \$540 million with completion in four or five years, but could increase to \$700 million after interest charges, pre-production operating costs and working capital are included (Regina Leader-Post, October 3, 1988).
 - Canamax to be licensed to build mine based on recommendations contained in a Clean Environment Commission report (Winnipeg Free Press, January 27, 1989).

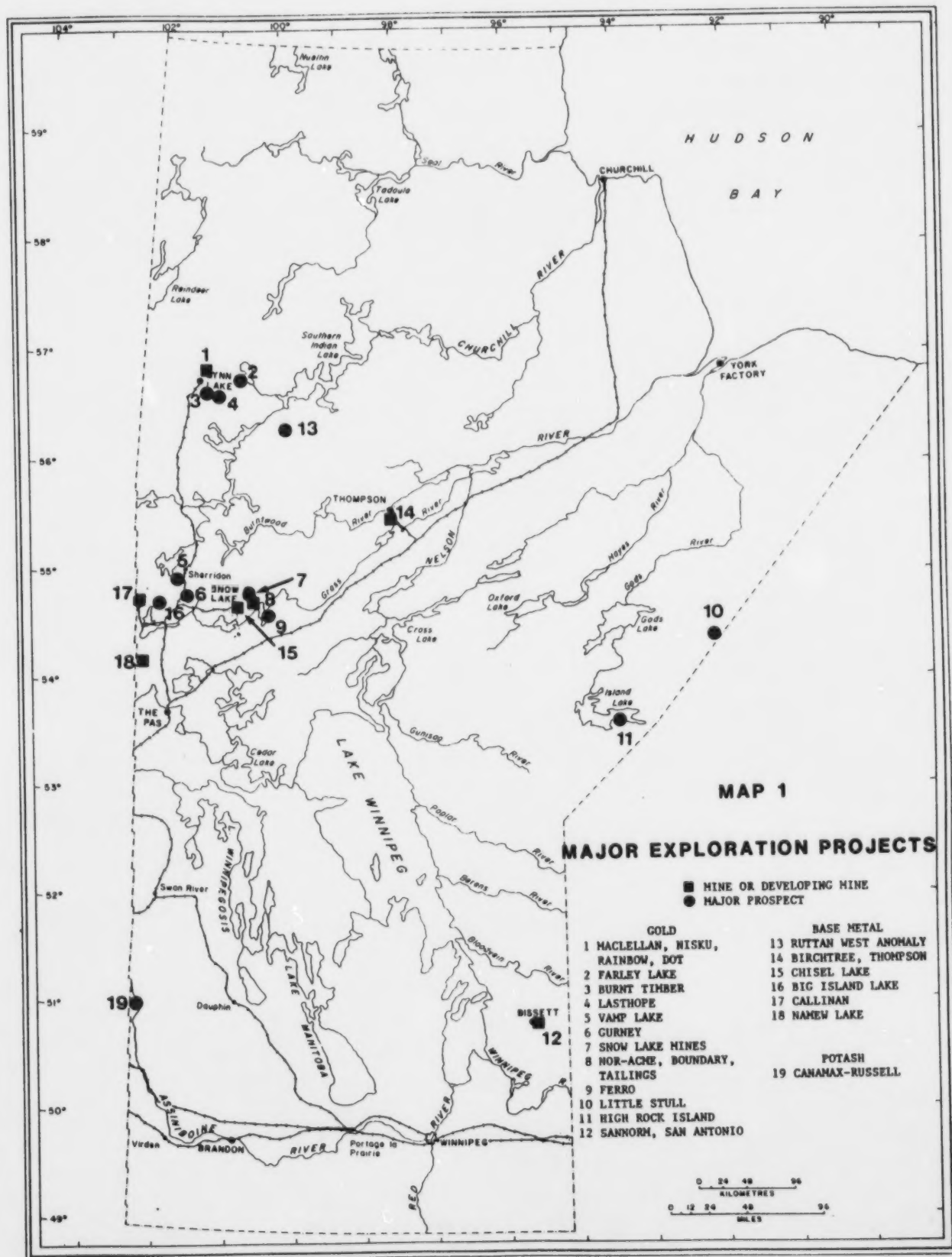
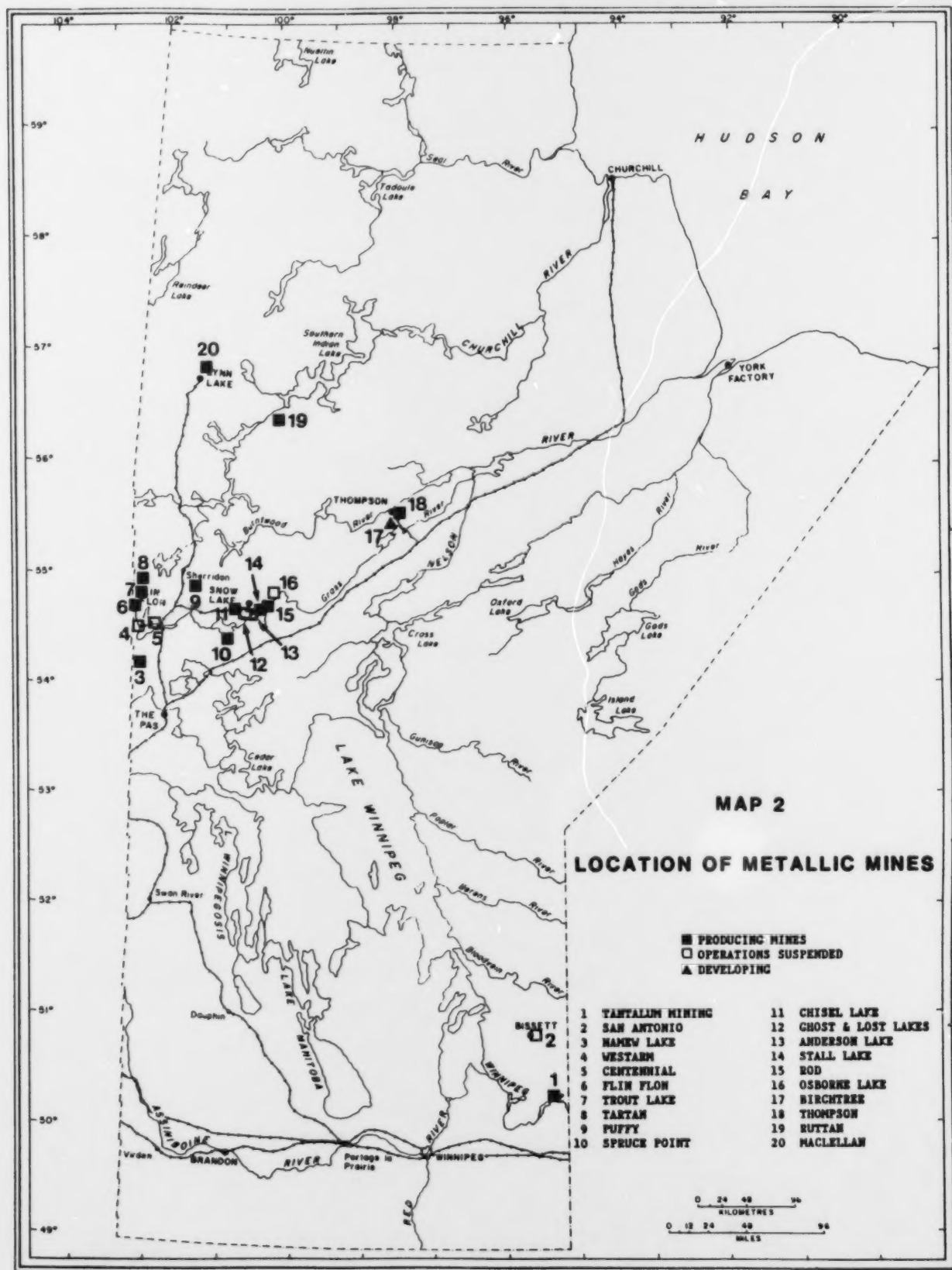


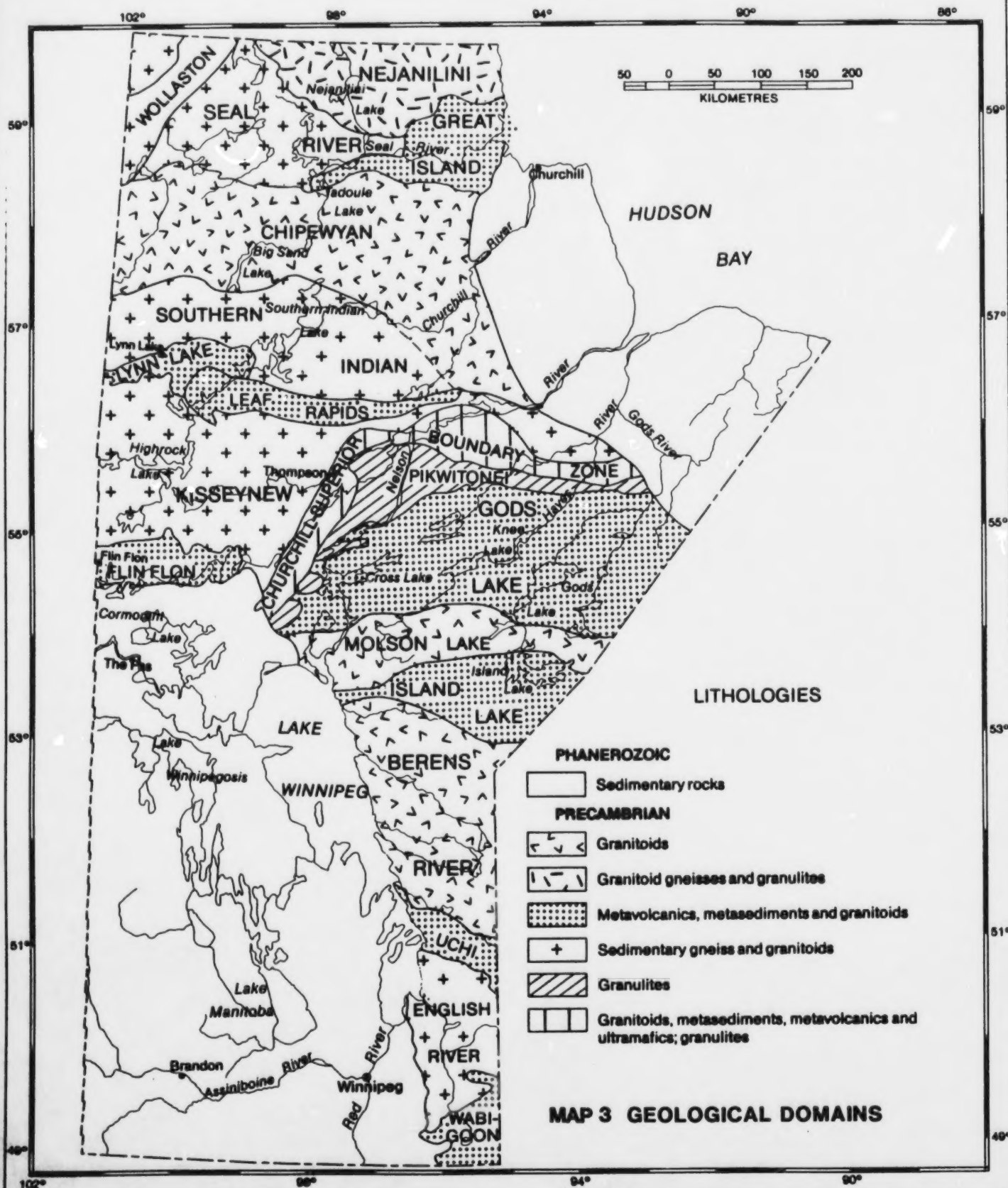
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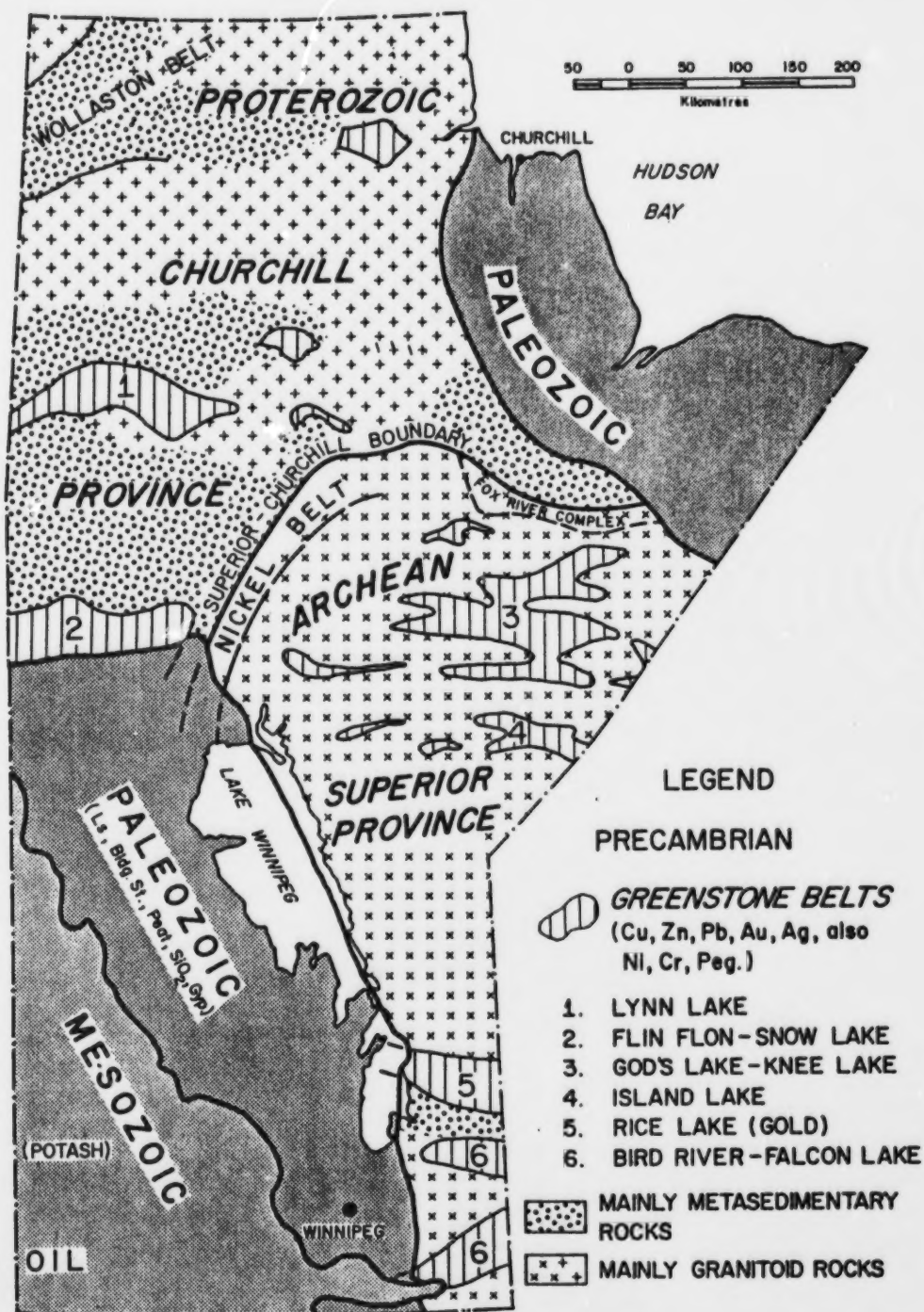
METAL MINING OPERATIONS IN MANITOBA	MINE	METAL	OPERATION	INDICATED CAPACITY	MANAGER AND ADDRESS
Granges Exploration Ltd.	Tartan Lake	Au	Underground	250 tpd	Rudy Rucker Mine Manager Box 849 Flin Flon, MB R8A 1N9
Hudson Bay Mining and Smelting Co. Limited	<u>Flin Flon Area</u>				
	Flin Flon	Cu Zn	Underground		Mr. Lloyd Nilsen President & Chief
	Westarm*	Cu	"	4,500 tpd	Operating Officer
	Spruce Point	Cu Zn	"		200-3 Lombard Pl.
	Trout Lake	Cu Zn	"		Winnipeg, MB
	Nome Lake	Ni	"		R3B 0Y4
	Callinan	Cu Zn	Developing		
	<u>Snow Lake Area</u>				
	Osborne Lake*	Cu Zn	Underground		
	Stall Lake	Cu Zn	"		
	Chisel Lake	Cu Zn	"	3,500 tpd	
	Chisel Lake				
	Open Pit	Cu Zn	Being Developed		
	Rod	Zn	Underground		
	Ruttan	Cu Zn	Underground	8,000 tpd	Mr. M. Kirby Manager Ruttan Mine Leaf Rapids, MB R0B 1W0
Inco Limited	Thompson	Ni	Underground	6,200 tpd	L. M. Ames President
	Thomp. Open Pit	Ni	Open Pit		Manitoba Division
	Birchtree	Ni	Developing		Thompson, MB
	Soab South**	Ni	Underground		R8N 1P3
	Soab North**	Ni	"		
	Pipe No. 1 & 2**	Ni	"		
Pioneer Metals Corporation	Puffy Lake	Au	Underground	1,000 tpd	Mr. E.O. Andersen Mine Manager Sherridon, MB R0B 1L0
LynnGold Resources Inc.	MacLellan	Au Ag	Underground	1,000 tpd	Mr. K.D. Ball Mine Manager
	Nisku	Au Ag	"		MacLellan Mine Lynn Lake, MB R0B 0W0
Cassiar Mining Corp.	San Antonio*	Au	Underground		Ms. P. Gratentine Secretary Bissett, MB R0B 1W0
Tantalum Mining Corporation of Canada Ltd.	Bernic Lake	Spodumene Tantalum	Underground	100 tpd	Mr. R. O. Burt General Manager Box 2000 Lac du Bonnet, MB R0E 1A0

* Temporarily suspended ** Temporarily suspended and allowed to flood tpd - tons per day

02/24/89







MAP 4 GENERAL GEOLOGY AND METALLOGENY OF MANITOBA